The University of Chicago

DATE CULTURE IN ANCIENT BABYLONIA

A DISSERTATION

SUBMITTED TO THE FACULTY
OF THE GRADUATE SCHOOL OF ARTS AND LITERATURE
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF ORIENTAL LANGUAGES AND LITERATURES
IN THE GRADUATE DIVINITY SCHOOL

BY
AUGUST HENRY PRUESSNER

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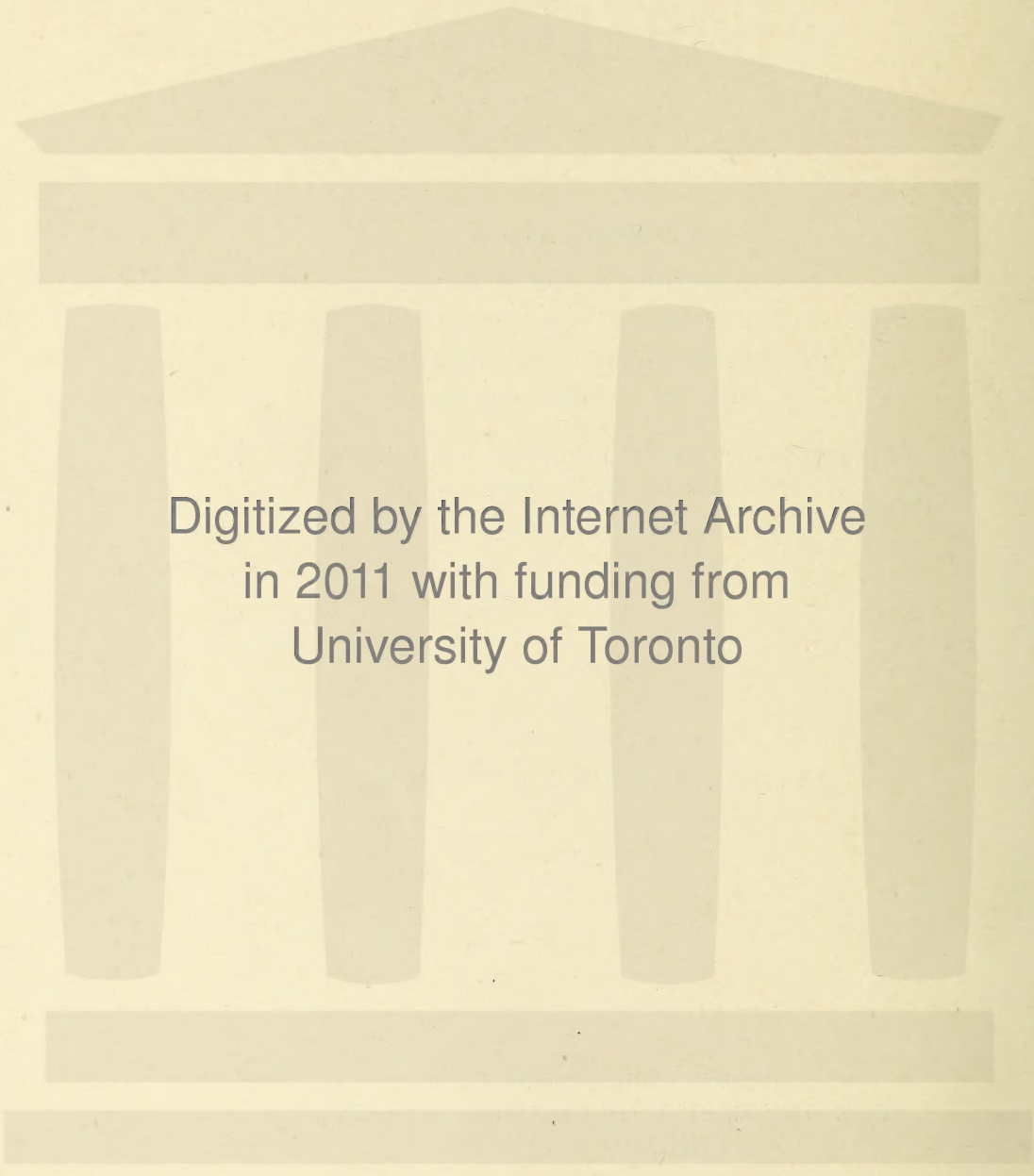

DATE CULTURE IN ANCIENT BABYLONIA

By A. H. Pruessner
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In the *Revue d'Assyriologie* of 1913, V. Scheil called attention to the importance of the date-palm culture for ancient Babylonia, and to the comparatively high state of perfection which it had attained.[1] His remarks were based on a tablet of his own, coming from Umma, and a fragment of another from Nippur.[2] From these documents he draws the following conclusions:

1. That there existed as early as 2400 B.C. in the Tigris-Euphrates Delta large date-palm orchards of many hectares in extent;

2. That the size of orchards was readily estimated, not by the usual field measurements, but by the number of trees in it;

3. That artificial fecundation of the female date tree was employed, and that male trees were grown apart;

4. That the estimation of the produce was made according to *series* of trees of practically equal bearing ability, and instead of *weight*, volume measure was employed;

5. That the maximum yield per tree went as high as 300 ḳa (105 kilograms, or 141 liters);

6. That accounts in this matter were kept with rigor and preciseness, according to the most rational proceedings.

Since the publication of this short article of Scheil's the subject has received, at least as far as the writer was able to ascertain from the bibliographies at his disposal, no further treatment from Assyriologists. It certainly does not seem out of place to gather together the facts concerning date culture from the various documents now at our disposal in an attempt to gain a better understanding of this important factor in the economic life of the early inhabitants of the Mesopotamian Delta.

[1] *De l'exploitation de dattiers dans l'ancienne Babylonie.*

[2] Published by Myrhman in *BE*, III, 63.

The writer in undertaking this task is well aware of the disadvantage at which he is placed by not having any practical, personal experience in date culture as it is carried on today in those regions. Fortunately there are at his disposal two excellent modern authorities, namely, the reports of two experts of the United States Department of Agriculture, one having been sent to Algiers[1] and the other to southern Mesopotamia[2] to make a thorough study of the subject in question at these two most prominent centers of date growing of our days. These two reports contain a wealth of facts, given in clear, simple language, while their usefulness is still further enhanced by a large number of beautiful half-tone illustrations from actual photographs. With these modern authorities as our guides, we shall now set out on a trip of inspection through the palm groves of ancient Sumer and Akkad.

Today the center of the most extensive date-palm plantations in the world is found in the district of Bassorah and Mohammerah along the banks of the Shatt-el-Arab. Travelers entering Mesopotamia from the Persian Gulf by way of this river marvel at the seemingly endless forest of palms, which is estimated to contain some five million trees. The predominance of date culture in this region is due to the fact that the most favorable conditions for the growth of this palm are found here in a happy combination. According to an old Arab saying the date palm will flourish best with her foot in water and her head in hell, and this prerequisite is remarkably well fulfilled in lower Mesopotamia. The summer heat is terrific, and because of the humidity of the air due to the palm groves, which give off a great deal of moisture, very oppressive, and for Europeans almost unbearable. According to Dr. S. M. Zwemer at Bahrein the thermometer remains for many days and nights above 100° F. from May to September, while for the Shatt-el-Arab as high as 124° in the shade has been recorded. Hand in hand with this climatic condition, so desirable for date growing, goes the ease with which irrigation is

[1] Walter T. Swingle, *The Date Palm and Its Utilization in the Southwestern States*, U.S. Department of Agriculture, Bureau of Plant Industry, Bulletin 53.

[2] David G. Fairchild, *Persian Gulf Dates and Their Introduction into America*, Bulletin 54.

accomplished.[1] The banks of the river are so low that the Arabs, while sitting on them can wash their hands in the flood. The influence of the tides of the Persian Gulf reaches far up into the channels of the Euphrates and Tigris. At Bassorah the high tide raises the river about six feet above its low level, and thus twice daily the countless canals and irrigation ditches are filled with the warm water from the river. No power of any kind is needed for this tidal irrigation, except for the task of keeping open the channels.[2] Also the demand for a slightly alkaline soil is satisfied throughout the delta of the "two rivers."

At the period with which we are concerned most of the region described above was probably still covered with swamps and lakes. The ^{nâru} Maratti, a broad estuary forming the mouth of the "two rivers" reached in all probability northward to the region of Ur and Eridu, while eastward the Susiana marshes stretched toward Elam. Sumer, the ancient center of date growing in the south, extended from Eridu northward along the banks of the present Shatt-el-Hai, which was then the main channel of the Tigris. The conditions in this region were without doubt just as favorable as they are today in the Bassorah district. That the ideal free-flow irrigation was possible here, we have by authority of Sir W. Willcocks.[3] Besides Sumer in the south, Akkad in the north of the delta had its date culture. Even today palm groves of considerable extent are found around Bagdad, and at Hillah on the Euphrates. The summer heat is here practically the same as farther south, and irrigation was made easy in the days of Babylonia's glory through proper regulation and distribution of the waters of the Euphrates during the flood season, which lasts throughout the summer until September. The rather large space devoted to the subject of date culture in the Code of Hammurabi testifies to the important position which it occupied in the agricultural life of his empire. For a later time we have the testimony of Greek travelers in regard to the wealth of Babylonia in date palms; Herodotus informs us that palm trees grew in great numbers over the whole of the flat country.

[1] Fairchild, *op. cit.*, p. 10. [2] *Ibid.*, p. 14.

[3] Sir William Willcocks, *From the Garden of Eden to the Crossing of the Jordan*, p. 3.

SECTION I

THE PLANTING OF A DATE ORCHARD

The date palm propagates its kind in two ways: from seeds and by offshoots from the roots of the parent tree. It has been found, however, that the fruits of trees grown from seeds exhibit marks of deterioration from the original kind. For this reason the tree is propagated in all important date-growing regions by transplanting the offshoots, which reproduce exactly the parent variety of dates. Such offshoots are produced very abundantly by young date palms, but care should be taken never to let more than four grow at the same time, since otherwise the growth of the palm would be unfavorably affected. Just as soon as their sex can be recognized they are removed and transplanted.

It is very important that the offshoots be planted high enough so that the growing bud in the center is never in danger of being covered with water when irrigated. In order to force the offshoots to take roots and grow the chief requisite is that the ground be kept constantly wet about their bases. If the young plants dry out once they are lost, for the delicate new roots that are just forming will be killed. The Arabs water the offshoots every day for the first forty days after planting and then twice a week until winter; after which they are watered as often as may be necessary to keep the ground thoroughly moist.[1]

The young plants must also be protected against cold the first winter after they are set out. Under favorable conditions these offshoots begin to bear fruit the third or fourth year after transplanting.

Having obtained this necessary information concerning the requirements for planting a new, or enlarging an existing, date orchard, let us turn to the documents from ancient Babylonia that have any bearing on our subject. The safest way will be to consult the law of the land first, namely the Code of Hammurabi. Four paragraphs (60–63 incl.) are devoted to questions regarding the planting of date orchards.

§ 60: If a man give out a field to a gardener for the purpose of planting a date orchard, the gardener shall plant the orchard; four years he shall take

[1] Swingle, *op. cit.*, p. 21.

care of the orchard, in the fifth year the owner of the orchard and the gardener shall divide equally (the produce of the orchard); the owner of the grove shall choose his share and take it.

In this paragraph the great king assumes the case, that a Babylonian landlord intrusts to somebody a piece of land to have it converted into a palm grove. The offshoots, no doubt, can be procured on the landlord's estate, but the gardener will have to do the transplanting. For three years he will have to take care of the young palms in the manner described above. In the fourth year, when for the first time a goodly produce could be expected, the owner and the planter were to divide it equally, the owner having the right of first choice. At first sight this remuneration for three years' work seems to be rather meager, a consideration which has led Dr. Kohler to the opinion that this paragraph gave to the gardener legal title to one-half of the orchard which he planted.[1] This view is, of course, erroneous. The planter got his pay for the years during which he took care of the unproductive young palms from the so-called secondary cultures between the trees. A large percentage of the surface could be sown to good advantage with grain, sesame, millet, or clover. The crop thus produced was evidently at the disposal of the laborer, since no provision whatever is made in regard to it. To this was added in the fourth year one-half of the yield of dates from the grove.

§ 61: If the gardener does not complete the planting, but leaves an empty space, that empty space shall be assigned to his share.

The import of this provision is very clear. It is to furnish the planter with an incentive to do his duty, and to keep him from loitering. Naturally, since the owner was to select his share first, the empty space would remain for the negligent gardener.

§ 62: If he do not plant the field entrusted to him, then in case it is a grain field, the gardener shall pay rent to the owner of the field, for the years during which he has neglected it, on the basis of adjacent fields, and after he has prepared the field for cultivation, he shall return it to its owner.

[1] Kohler und Peiser, *Hammurabis Gesetz*, pp. 112–13: "Bei der Dattelpacht finden sich noch besondere interessante Verhältnisse: der Eigner überlässt dem Landmann ein Gelände zur Dattelbepflanzung; die Pflanzung dauert 4 Jahre; im 5. Jahre tritt als Belohnung für die Arbeit Miteigentum am Grundstück ein, und der Arbeiter wird Eigentumsgenosse, wobei der bisherige Eigner das Recht hat seinen Teil auszuwählen, § 60."

This paragraph provides redress against a flagrant neglect of duty on the part of the planter. He has not only failed to plant the orchard, but has also allowed the productive field to deteriorate. In such a case the Code stipulated that the neglectful planter must pay to the owner the rate of rent common for such lands. Estimation of the yield was made on the basis of that of adjacent fields. Besides paying this rent he had to return the field in a condition fit for immediate cultivation. Should the neglect prove to be serious it might entail for the planter two years of hard work to reclaim (pitû) the field. During this time little produce could be expected, yet the owner demanded the pay of the full legal rate of rent. Certainly, any planter could ill afford the luxury of loafing when he undertook to plant a date orchard for a Babylonian landlord.

§ 63: In case the field was unreclaimed, he shall prepare it for cultivation and return it to the owner of the field, and per 18 gan he shall pay 10 gur of grain for one year.

The case assumed here is like that of § 62, with the exception that the field in question had been an unreclaimed tract of land. In this case the task technically called *teptitum* was imposed upon the planter, i.e., he had to convert the unreclaimed field into productive land, and pay full rent for one year.

From these provisions of the Code respecting the planting of date orchards we may safely infer that the young trees planted were exclusively offshoots from parent trees, otherwise a date harvest could not have been expected from them for the fourth year. Seedlings require from 8–15 years before they produce fruit. Turning now to the contract literature to illustrate the Code with sample cases from actual life we find a great scarcity of material. There is only one tablet which has reference to the planting or rather enlarging of a date grove, namely:

VS, VII[21] (Dilbat)

TRANSLITERATION

1. *iṣu Kirûm ma-la ba-z[u-ú]*
2. *iṣu kirî ilu šamaš-nu-úr-ma-tim*
3. *itti ilu šamaš-mu-úr-ma-tim*
4. *lugal Giš-Sar-E*
5. *m. ilu marduk-na-ṣi-ir*

6. *mar ḫu-za-lum*
7. *Nam . Gal . Kid . Kid . A*
8. *Nam . Mu . III kam*
9. *Ib . Ta . É . A*
10. *Mu III kam i-ka-al-ma*
11. *iṣu kirâm u-na-pa-aš*
12. *iṣu kirâm za-ka-am*
13. *a-na be-li-šu*
14. *Gur . Ru . Dam*

TRANSLATION

A date orchard, as much as there is, the orchard of Šamaš-nûr-mâtim, from Šamaš-nûr-mâtim, the owner of the orchard, Marduk-nâṣir, son of Ḫuzalum, has rented for three years, for the purpose of enlarging it.

While he has use of the orchard for three years, he shall enlarge it, and return it in good condition to its owner.

Two witnesses, and the date: Sixth Simanum, fifth year of Samsu-iluna.

NOTES

Line 4: Semitic equivalent = *bêl iṣu Kirîm*.
Line 7: literally, "for making wide"; Semitic equivalent given in line 11.
Line 12: literally, "a clean orchard."
Line 14: Semitic = *u-ta-a-ar*.

Šamaš-nûr-mâtim rents out an already existing palm grove to Marduk-nâṣir to have it enlarged. The latter shall have usufruct of the orchard for three years, while he is planting and taking care of the young palms. The provision of § 65 of the Code, that planter and owner shall divide the produce of the planted orchard during the fourth year, does not apply here since the renter has been remunerated for the work performed by the produce of the existing part of the orchard.

Another question that should be treated before closing this section pertains to the distance that the trees should be planted apart. Mr. Swingle tells us that the Arabs have been in the habit of placing them very close together. The first French colonists in Algeria followed this custom and planted the trees about 20 feet apart. Similar conditions must prevail in the Bassorah district, where, according to Mr. Fairchild, as many as 100 trees are planted on a "djerib," the latter being a little less than an acre. The French colonists have, however, discovered that far better results are

obtained if a much wider space is left between the trees. They now place them from 26 to 33 feet apart. With a distance of 26 feet between the trees about sixty can be planted to an acre. To arrive at a conclusion concerning the habits of the ancient Babylonians in this respect is well-nigh impossible. Their contracts and other documents either state the size of the orchards by the field measurements in use without reference to the number of trees on it, or else they give the number of trees on a certain lot without expressing its size in units of square measure. There is a single document which enables us to make some comparisons:

VS, XIII[70 and 70a] (Senkereh)

TRANSLITERATION

1. ½ *gan*+20 *sar* ^{iṣu} *kirûm*
2. *lib-ba* 25 ^{iṣu} *gišimmari*
3. *ita* ^{iṣu} *kirî a-pil-i-li-šu*
4. ^{m} *i-li-i-di-nam*
5. *u nu-ur-*^{ilu} *Kab-ta*
6. ^{iṣu} *kirûm e-te-el-pi-*^{ilu} *ištar*
7. *itti e-te-el-pi-*^{ilu} *ištar*
8. *lugal Giš . Sar . E*
9. ^{m} *a-pil-i-li-šu*
10. *In . Ši . Šam*
11. 6½ *šiklu kaspim*
12. *Šam . Ti . La . Bi . Šu*
1. *In . Na . An . Lal*

TRANSLATION

Seventy sars of date orchards, in it 25 date palms, by the side of the orchards of Apil-ilisu, Ili-idinam, and Nûr-Kabta, the orchard of Etel-pi-Ištar, from Etel-pi-Ištar, owner of the orchard Apil-ilišu has bought.

6½ šekels of silver, its full price, he has paid.

Date: Rim-Sin, Isin 10.

The statement important for our investigation is contained in lines 1 and 2, namely, that there are 25 trees in this grove of 70 sars. Accepting Thureau-Dangin's calculations[1] of old Babylonian square measure, this surface would be a little less than half an acre. A distance of 30 feet between the trees would correspond to about

[1] *Journal Asiatique*, 1909, pp. 79 ff.: "L'U, le Qa et la Mine."

50 trees per acre. If it be permissible to draw conclusions from a single tablet, its testimony would tend to show that the Babylonians left such ample space between the trees as modern scientific date growers find it most advantageous to give.

SECTION II

CARE REQUIRED BY DATE PALMS

Before taking up the study of this topic from the standpoint of the cuneiform documents let us again first consult our modern authorities. As regards the care of the soil, Mr. Fairchild informs us that

> just before a plantation is set out with suckers the soil is dug over by hand to a depth of 18 inches, and this digging is repeated every four years. Weeding is done when necessary and the surface of the ground occasionally stirred.[1]
>
> The chief care required by date palms is that they be irrigated as often as needful. The soil should be kept in proper state of tilth, which is usually done by growing some crop between the rows, especially when the palms are young. The leaves are trimmed off as they die, and care is taken not to allow too many offshoots to grow up at the base of the stem, for they draw on the strength of the parent plant. In general not more than three or four offshoots should be allowed to grow at once. At least one should always be left attached to the mother plant to be used to replace it in case of accident. Old palms, ten to fifteen years after planting, which have developed a good trunk 4–10 feet high, do not produce offshoots, and such trees require no attention other than the cutting away of dead leaves, the pollination of the flowers, and the gathering of the fruit.[2]

Having provided ourselves with these few elementary facts concerning the proper care of date palms, we are so much the better equipped for the task of discovering traces of these facts in the cuneiform texts. That the Babylonians thought it necessary to have the soil of their orchards dug over is evident from the following tablet:

R23,[3] transl. by Schorr, *Altbabylonische Rechtsurkunden*, p. 189

TRANSLITERATION

1. ^{iṣu} *kirûm ma-la ba-zu-u*
2. *i-na a-aḫ-hi* ^{nâru} *Puratti*

[1] Fairchild, *op. cit.*, p. 19.

[2] Swingle, *op. cit.*, p. 25.

[3] Ranke, *Babylonian Legal and Business Documents*, Series A, Vol. VI, Part I.

3. *itti šu-lu-ur-tum*
4. *marat* ^{ilu} *i-šum-ba-ni*
5. $^{m.}$ *u-ṣi-bi-tum*
6. *mâr pur-* ^{ilu} *adad*
7. ^{iṣu} *kirâm a-na ša-ku-nu-tim*
8. *u-še-zi.*
9. ^{iṣu} *kirâm i-ra-bi-iḳ*
10. *a-ra-am zi-na-tum*
11. *i-na-ṣa-ar*
12. *a-na bi-ḫa-at* ^{iṣu} *kirîm*
13. *i-za-az*
14. *ma-na-aḫ-ti* ^{iṣu} *kirîm*
15. *i-ma-ru-ma*
16. *i-pa-al-šu*
17. [*ri-ib-ga-ti*
18. *i-ma-ru*
19. *eḳlam ki-ma eḳlim*
20. *i-ka-al*

TRANSLATION

A date orchard as much as there is, on the bank of the Euphrates, from Šulurtum, the daughter of Išum-bâni, Uṣibitum, the son of Bur-Adad, has rented the orchard for caretaking.

He shall spade the orchard; of the blossoms he shall take care; for any damage to the grove he will be held responsible. Any deterioration of the orchard they will estimate and he shall refund; the spading they will inspect, field for field he will enjoy accordingly.

NOTES

Lines 7 and 8: *ana šakanutim ušezi*, technical term for the renting of a date orchard, corresponding to *ana irišutim ušezi* in renting grainfields.

Line 9: *i-ra-bi-iḳ*, according to Schorr from √רפק; compare Aram. רפק פרדיסא = to spade a garden. Levy, *Neuhebr. Wörterbuch.*

Line 10: *arâm zinatum:* these terms will be explained later in connection with the pollination of the date trees.

Lines 14–16: Schorr translates, "Sobald er (sc. der Eigentümer) die Auslagen für den Garten geprüft haben wird, wird er sie ihm zurück erstatten"; i.e., any expenses which the renter may have while taking care of the orchard will be refunded by the owner. This makes good reading but does not reproduce the original. First of all the owner is not a man; the verb should therefore have the feminine form if it referred to the owner. Secondly

imâruma is plural and not singular. The sense undoubtedly is, that at the end of the period of renting the owner, either with witnesses or with the renter, will inspect the orchard, and if through the neglect of the renter any deterioration in the upkeep of the orchard has taken place, the latter will have to restore the damage. *Manaḫti* from אנח has the meaning of ruin, decline, decay, etc.; cf. Delitzsch, *HW*.

Lines 17–20: In like manner they will take note of the portion that has been spaded by the renter, and he will be entitled to the produce of that portion. This provision is found on the case tablet only.

The contract imposes two duties upon the *šakinum:* (1) he shall spade the garden, (2) he shall watch *arâm zinatum.* This latter provision brings us, as we shall see, face to face with an operation that is of eminent importance in rational date culture, namely the process of artificial pollination. A thorough understanding of this process will, in the writer's opinion, throw light on some difficult passages in the Code and the contract literature. We must therefore take time to let our experts explain it to us.

Unlike most fruit trees, the date palm has the male and female flowers on separate individuals. . . . . In a wild state the date palm is undoubtedly pollinated by the wind, and about one-half of the trees are males. . . . . The artificial pollination was doubtless discovered by the ancient Assyrians,[1] and has been practiced for three or four thousand years at least. Because of the great economy of pollen brought about by this practice, one male tree suffices to pollinate from fifty to a hundred females. The male flower cluster of the date palm consists of a stalk bearing a considerable number of short twigs to which the flowers are attached, the whole contained in a sheath at first entirely closed, but which finally ruptures, disclosing the flowers. . . . . The separate twigs to which the male flowers are attached are from 4–6 inches long, and bear anywhere from 20–50 male flowers, each containing 6 anthers full of pollen. One of these twigs suffices to pollinate a whole female flower cluster, and to bring about the development of a bunch of dates.

The female flowers, like the male, are borne inside of sheaths which are at first entirely closed. Finally the sheath is split open by the growth of the flowers within, and at this stage pollination is accomplished. The two tips of the cracked-open sheath are separated and the cluster of female

[1] The author probably uses the term *Assyrians* in the loose sense in which it was formerly employed, and included the inhabitants of the Tigris-Euphrates Delta, who were, of course, the date growers.

flowers pulled out. A twig of male flowers is then inserted into a cluster of female flowers and tied in place with a bit of palm leaf or with a string. This completes the process of pollination.[1]

Other facts which should be borne in mind are the following: (1) The female flower clusters do not all appear at the same time, but several weeks may elapse between the appearance of the first and the last clusters. During all this time the trees must be closely observed so that no female clusters may be overlooked. (2) Female flowers may appear at such an early or late date that no male trees are in bloom. Against this emergency the date grower could easily protect himself by storing away some male flower clusters, the pollen of which, it is said, does not deteriorate for at least two years. (3) A female flower cluster not pollinated will grow dates, but such dates are without seeds, they never properly mature, and are without commercial value.[2]

That artificial pollination of the date palm was practiced during the period of the Assyrian Empire is certain from monumental evidence.[3] For early Babylonia the case is not so clear. Scheil, as we have seen, made the inference that it was employed as early as 2400 B.C. If it was known in the days of Hammurabi, it would indeed be peculiar if his Code should be without any provision in regard to this important work. But there are still two paragraphs on date culture awaiting our investigation, namely, §§ 64 and 65. Both have caused the translators a lot of trouble. It will be well, therefore, to reproduce them here in transcription and translation as found in Harper's *Code of Hammurabi*, p. 33.

§ 64

TRANSLITERATION

šum-ma a-wi-lum kirâ-šu a-na Nu . Giš . Sar a-na ru-ku-bi-im id-di-in Nu . Giš . Sar a-di kirûm ṣa-ab-tu i-na bi-la-at kirîm ši-it-ti-in a-na be-el kirîm i-na-ad-di-in ša-lu-uš-tam šu-u i-li-ḳi.

TRANSLATION

If a man give his orchard to a gardener to manage, the gardener shall give to the owner of the orchard two-thirds of the produce of the orchard, as long as he is in possession of the orchard; he himself shall take one-third.

[1] Quoted from Swingle, *op. cit.*, pp. 16, 26, 27.

[2] Swingle, *op. cit.*, pp. 27–28.

[3] Cf. *Guide to Babylonian and Assyrian Antiquities* (British Museum), 2d ed., Pl. X.

§ 65

TRANSLITERATION

šum-ma Nu . Giš . Sar kirâm la u-ra-ak-ki-ib-ma bi-il-tam um-ta-di Nu . Gis . Sar bi-la-at kirîm a-na i-te-šu [i-ma-ad-da-ad].

TRANSLATION

If the gardener do not properly manage the orchard, and he diminish the produce, the gardener shall measure out the produce of the orchard on the basis of the adjacent orchards.

The important work which the gardener is to perform, and through the neglect of which he may seriously diminish the produce of the date grove, is designated as "rukubum." The term is rendered by Harper *to manage;* in this he is followed by Rogers.[1] Ungnad translates *bewirtschaften;*[2] Winckler *bearbeiten,*[3] which practically amounts to the same thing as the English translation above. These renderings, which are not even warranted by any of the meanings of the √רכב, are too general and only a confession that the real significance of the term was not clear to the translators. Consulting Delitzsch, *HW*, p. 620, we find a secondary meaning for *rakâbu* which is expressed by the equations:

Ḫi . Nir=r]a-ka-bu
Ḫi . Nir=ri-ḫu-tu;

also

(*a–a*) *A=rikibtum*
(*a–a*) *A=riḫûtum.*[4]

We may conclude, therefore, that some forms of *rakâbu* were employed to designate the act of fecundation. This information does, however, not take us very far, though it may serve as a hint that we are on the right track. We are obliged to invoke the aid of the cognate languages. Turning to a dictionary of the Talmud,[5] we make the discovery that √רכב in the Hiphîl may mean *to graft, to*

[1] Rogers, *Cuneiform Parallels*, p. 417.

[2] Ungnad in Gressmann, *Altorientalische Texte und Bilder*, p. 150.

[3] Winckler in *Der alte Orient*, Heft 4.

[4] Cf. also Muss-Arnolt's *Dictionary*, p. 963.

[5] Levy, *Neuhebr. und chaldäisches Wörterbuch über Talmudim und Midrashim.*

place one branch upon another. Reference is made to a passage in the Babylonian Talmud, in which it is stated that it was lawful for the people of Jericho *to graft* date palms all day on the fourteenth of Nisan[1] (i.e., on the eve of Passover), because otherwise they would spoil. Evidently we are getting nearer the secret, for now there has been established at least a connection between the √ רכב and the date palm. Yet it must be remembered that the very nature of this tree makes grafting impossible and unnecessary. The date palm has no branches but only immense leaves, which, if they were grafted on another trunk, would never produce a fruit-bearing crown. Offshoots, however, are never grafted upon another trunk, but are transplanted as soon as they have obtained proper size, which is the safest and least complicated way of propagating a certain kind of date. Grafting is furthermore not an operation which could not be put off a few days longer. Considerations of this nature would lead to the belief that the process referred to is nothing but the pollination of the female flower clusters.

But the Babylonian Talmud brings us still nearer the goal. Rabbi Rashi, commenting on the above passage, describes the ריכבא דדקלא as follows: ענף רק של דקל זכר ומרפיבן בסדג של דקל נקבה מפני שדקל נקבה אינה עשה פירות והזכרים עשין פירות,[2] i.e., a soft branch (of the flower cluster) of the male date palm is placed in the split (of the flower cluster) of the female palm, because a female palm does not bear fruit, while a male does.[3]

After this excursion to the Talmud we should be justified to return to our deserted two paragraphs of the Code and insert in the place of "to manage," *to pollinate.*

§ 64: If a man entrust his date grove to a šakînum for pollinating, the šakînum shall give of its produce, for the time that he holds the orchard, two-thirds to the owner of the orchard; one-third he himself shall take.

§ 65: If the šakînum does not pollinate the orchard and thereby diminish the produce, he shall pay rent on the basis of the adjacent orchards.

[1] Pes. 4:9 (55b) מרכיבון דקלים כל היום.

[2] Pes. 66a.

[3] The words in parentheses are inserted by the writer to show what really took place. Rashi evidently knew in a general way of the significance of pollination for the growing of dates, but was lacking in exact knowledge, as his statement, that the male palm was bearing fruit, shows.

Among the contracts concerning rent of date groves one of the most interesting is doubtless

VS, VII[34]

TRANSLITERATION

1. *iṣu kirâm ilu Amurru*
2. *ugar a-ra-aḫ-tum*
3. *u-at-ru-tum*
4. *u ta-lu ša li-bu eḳ-lim?*
5. *iṣu kirî ḫu-ra-za-tum*
6. *itti ḫu-ra-za-tum*
7. *m a-pil i-li-šu*
8. *mâr m uraš-mu-ba-li-it*
9. *a-na ša-ki-nu-tim*
10. *[Ib] . Ta . É . A*
11. *[iṣu ki]râm u-ra-ka-ab-ma*
12. *[ši-it]-ti-in*
13. *be-el iṣu kirîm*
14. *[ša]-lu-uš-ta-am*
15. *ša-ki-nu-um*
16. *i-li-ḳi*
17. *V bi-la-tim u-ri-e*
18. *X ši-si-na-tim*
19. *i-na-ad-di-in*

TRANSLATION

A date grove of the god Amurru, in the field of the Araḫtum-[canal],—(there are) dry leaves and offshoots,—the date grove of Ḫurazatum, from Ḫurazatum, Apil-ilišu, the son of Uraš-mubaliṭ, has rented for caretaking. He shall pollinate the orchard; two-thirds (of the produce) the owner of the garden, one-third the renter shall take.

Five talents of urê, ten male flower clusters he shall give (besides).

NOTES

Lines 3 and 4, probably best construed as an inserted nominal sentence, descriptive of the condition of the orchard, and calling attention to the work required of the gardener; *u-at-ru-tum*, lit. "superfluous ones," very likely refers to dead leaves. With *u-at-ru-tum* compare neo-Babylonian *ḫarattu* > Talmudic חֲרוּתָא = a dried branch. *Ta-lu ša li-bu:* Sum. ^{giš}*Gišimmar . Tur . Tur* = *tâlu* = *liplipu* = *lipu* = offshoot; literally therefore the above term signifies "offshoots of offshoots." Compare with this Mr. Swingle's statement that

> the offshoots, when uncontrolled, grow unhindered, and rival in size the parent trunk, and they in turn give rise to other offshoots, so that finally the result is an impenetrable thicket with a few tall trunks, and a tangled mass of offshoots at the base; *op. cit.*, p. 15.

Lines 11–16 contain almost verbatim the provisions of § 64 of the Code.

Line 17: *urê* must be left untranslated at present; it doubtless refers to one of the extremely numerous by-products of the date palm.

Line 18: *si-si-na-tim* = *sissinatum* and *sissinnu*, plur. col. of *si*[*n*]-*nu* = cluster of date blossoms (*Dattelrispe*); cf. Delitzsch, *HW*, and Muss-Arnolt, p. 775, for references. Our contract helps us to identify the *sissinnu*, not with the flower cluster in general, but with the male blossom in particular. The renter is to deliver ten of them to the owner, and since the pollen can be kept for years against a case of emergency this stipulation becomes clear. Compare also the cases cited in Muss-Arnolt, p. 775: *sis-sin-na-šu ul e-tir* = its male clusters he shall not take; or *sis-sin-ni i-na-aš-ši* = the male clusters shall be brought, i.e., to the owner.

One more tablet should be more closely inspected, namely:

VS, VII[27], transl. by Schorr, 191, KU, III, 661

TRANSLITERATION

1. *XI gan eḳlum* ^{iṣu} *kirûm*
2. *ša pa-la-ag* ^{ilu} *Uraš*
3. *itti e-li-e-ri-sa marut na-ḫi-annum*
4. ^{m} *ta-ri-bu-um u-še-zi*
5. *li-ib-ba-am si-na-am*
6. *i-na-ṣa-ar*
7. *um* ^{um} *suluppi* (*Ka . Lum*)
8. *i-na i-li-im*
9. *šu-ku-na-am*
10. *i-ša-ka-nu-šu*
11. 1 *gan eḳlum Ka . Gar*
12. *šamaššammum ma-la*
13. *i-ba-šu-u*
14. *ša-lu-uš-ta-ša*
15. *i-na-ad-di-ši-im*

TRANSLATION

Eleven gan field, date orchard, of the Uraš-canal, from Eli-erisa, daughter of Naḫi-annum, Taribum has rented. He will take care of the pollination. At the time of date harvest, besides the produce of the orchard of which he took care, he shall give her from one gan of his usufruct (*eḳlum Ka . Gar*) sesame, as much as there is, her one-third.

NOTES

Lines 5 and 6: *libbâm sinâm inaṣar; libbu* ^{giš} *Gišimmari* = lit. the heart, i.e., the crown or leaf tuft of the date palm, which, as we know, constitutes its very life. The above expression is therefore evidently only a circumlocution for *rukkubum*, "he shall take care of (pollinate) the blossoming trees." The same is true of the phrase found above in R23, *a-ra-am zi-na-tum*

i-na-ṣa-ar. Delitzsch, *HW*, equates *arum* with the date flowers (Dattelblüte). It seems, however, more satisfactory to stay with the √ארה from which the forms *a-ru-u* and *u-ru-u* are derived, which, according to Delitzsch, denote "something done to a tree or forest . . . . but what?" *HW*, p. 130. But the most common meaning of the √ארה is *to be* or *to become pregnant*. Would it be too bold a speculation to venture an answer to the above question of Delitszch and translate the phrase in question "of the fecundation of the blossoms he shall take care"?

Lines 8–15: They are interesting in so far as they show how the renter was remunerated. The produce (*šukunnum*) of the orchard of which he took care (*i-šakanušu*) evidently went to the owner, but he received the secondary crop, with the exception of one-third of the sesame from one gan, which the landlady demanded for herself. *I-na i-li-im* (besides or above) is mistaken by Schorr for *ina ilipu*, and therefore translated "at the time when the offshoots will bear."—*Babylonische Rechtsurkunden*, p. 191.

In another type of contracts a fixed amount of dates is required as rent for an orchard. In this manner the owner protected himself against any diminished return from his grove through the negligence of the renter. The owner's demand had to be satisfied first, and the rest of the produce remained for the gardener. A contract of this type is represented in

VS, XIII[18] (Date: Hammurabi 23)

TRANSLITERATION

1. $4\frac{2}{5}$ *gur suluppi*
2. $2\frac{1}{5}$ *gur suluppi* (*damḳuti*[*?*])
3. *napḫar* $6\frac{3}{5}$ *gur suluppi É . A*
4. 10 *biltam u-ru-u*
5. 10 *biltam zi-zi-na-tum*
6. $2\times60+30+1$ ^{iṣu} *gišimmarê*
7. *biltam* ^{iṣu} *kirîm*
8. *ša* ^{m} *mu-na-wi-ir-tum*
9. *marat na-bi* ^{ilu} *šamaš*
10. ^{m} *ibiḳ-iltum*(*tum*)
11. *mâr i-ku-*(*un*)*-bi-ša*(*?*)
12. *iṣ-ba-at*
13. *waraḫ kislimum*
14. *i-na bâb ga-gi-im*
15. *giš-bar* ^{ilu} *šamaš Ni . Ram . E*
16. 10 *biltam u-ru-u*
17. 10 *biltam zi-zi-na-tum*
18. *la-bi-ir-ta-šu*
19. *i-na-ad-di-in*

TRANSLATION

$4\frac{2}{5}$ gur of dates $2\frac{1}{5}$ gur of ——— dates a total of $6\frac{3}{5}$ gur of dates rent. 10 talents of urê. 10 talents of flower clusters (of) 251 date palms, rent of the orchard of Munawirtum, daughter of Nabišamaš, which ———, son of ———, has taken.

In the month of Kislimum, in the gate of the temple compound, he shall pay according to standard measure of the Šamaš temple. Ten talents of urê, ten talents of flower clusters, his former dues, he shall give.

NOTES

Line 3: *É . A = šuṣû*, very likely rent (*Abgabe*). This document, which is designated in the index to VS, XIII, as a *Darlehen* (loan), is nevertheless clearly a contract concerning the rent of an orchard. For similar contracts see VS, VII[41], VS, VII[165], VS, VII[35], Th.D. 226.

Lines 10 f.: Cf. Ranke, *BE*, VI, Pt. I, "Concordance of Proper Names."

In summing up the results of our investigation of Old Babylonian documents pertaining to date culture, it might be stated that the inferences and conclusions of V. Scheil as stated in the introduction have been verified by direct evidence from the Hammurabi period. Above all, artificial pollination was a well-known process, and legally covered by at least two paragraphs of the Code. In other respects the Code gave legal sanction to time-honored customs which had been formed during many centuries in which the inhabitants of the Euphrates-Tigris Delta had enjoyed the blessings of this remarkable tree. Through them a high degree of efficiency was attained, and the interests of both the owner and renter were safeguarded.

SUPPLEMENT

DATE CULTURE AS AN ECONOMIC FACTOR

The date palm possesses in a high degree the love and esteem of those for whom it provides sustenance. The number of uses to which the tree and its products can be put is phenomenal; a Persian poem praises enthusiastically 365 ways in which it proves itself the benefactor of man. Strabo characterizes its usefulness to the Babylonians as follows: "All other wants (besides that of grain) are supplied by the date palm." Assyrian monuments are often picturing their soldiers in the act of cutting down and destroying the date groves of besieged or captured cities. These ruthless warriors

knew that by this act they would deal a death blow to the economic life of their enemies. Another witness to the high esteem in which the date palm was held in ancient Babylonia is the Code itself. See § 59, which decrees that "if a man, without the consent of the owner of an orchard, cut a tree in that man's orchard he shall pay one-half mina of silver." This extremely heavy fine was, of course, calculated to protect this beneficent tree from any would-be despoiler. The temptation to such a theft, no doubt, was very serious in a country which produced no other kind of lumber.

In an attempt to estimate the productivity of Babylonian date groves we are almost entirely dependent upon the material used by Scheil in the article referred to above. The orchard described on the Nippur fragment shows by far the better record. If we disregard the series of trees of 25 ḳa, for which the number is missing, it would contain 239 trees; the entire number may have been something like 250 trees. With an average of 50 trees per acre the size of the orchard would amount to about five acres, or 600 sar. The total produce of dates, calculated from the scribe's estimate, would be $56\frac{3}{5}$ gur. The record grove on the Umma tablet contains 341 trees with an estimated yield of 26 gur 185 ḳa. The total for the various groves mentioned on this tablet is 1,332 trees, with an estimated yield of 61 gur 154 ḳa. The highest yield per tree in the Umma orchards is 60 ḳa, while in the Nippur grove of the entire number of c. 250 trees there are 104 bearing more than 60 ḳa, seven trees yielding as high as one gur per tree. The impression which one gains from the Umma tablet is that it deals with young plantations; especially the rather high percentage of unproductive young trees favors this conclusion.

The maximum yield in the Nippur grove is one gur per tree from a series of seven. This would correspond to about 105 kilograms (c. 210 pounds) if the value of the ḳa is taken to equal .47 liters. Mr. V. Scheil regards this to be an extremely light yield when compared with modern figures, which often show double that amount. Should we, however, accept the value of the ḳa to be .81 liters, as more recently proposed by Thureau-Dangin (*Revue d'Assyriologie*, 1912, p. 24), then this discrepancy would disappear.[1] On this basis

[1] The writer notices that this value has been accepted by recent French writers on economic topics. It is especially in the realm of agriculture proper that a value higher than .47 liters seems to be almost imperative.

the highest yield would be c. 365 pounds, a figure which would still be very moderate, since, according to Mr. Swingle, a yield of from 400–600 pounds is not infrequent with rich soil and abundant irrigation (*op. cit.*, p. 24).

For the Hammurabi period there is only the above-cited contract VS, XIII[18] that could be drawn upon for making comparisons. The 251 trees mentioned are evidently the number of date palms found in the orchard. If the $6\frac{3}{5}$ gur of dates constitute about two-thirds of the produce, which the owner could legally demand for himself, then the entire yield was estimated about 10 gur of dates, plus the various by-products. This yield equals nearly that of the third lot on the Umma tablet, where 291 trees are estimated with 12 gur 218 ḳa, which would give for 250 trees an average of a little more than 10 gur.

There is still another way of arriving at an estimate of the economic importance of date culture, namely, by comparing the sales value of farm land with that of date orchards. For this purpose Volume VS, XIII proves a regular storehouse of information, for not less than twelve orchard sales are recorded. Comparing the average sales price of these orchards with the average value of farm lands during this period we will find that the former brought at least double the amount of the latter:

VS, XIII *Nu.*	Provenience	Date	Amount of Land	Price	Price per 100 Sars
Number 31.....	Sippar	Hammurabi 40?	5 sar	1½ šekels	30 šekels
Number 67.....	Senkereh	Rim-Sin, Isin 2	100 sar	7½ šekels	7½ šekels
Number 70.....	Senkereh	Rim-Sin, Isin 2	70 sar	6½ šekels	c. 9¾ šekels
Number 74.....	Senkereh	Rim-Sin, Isin 7	60 sar	6⅙ šekels	c. 10¾ šekels
Number 78.....	Senkereh	Rim-Sin, Isin 8	31 sar	6⅔ šekels	c. 20 šekels
Number 80.....	Senkereh	Rim-Sin, Isin 10	90 sar	21 šekels	23½ šekels
Number 81.....	Senkereh	Rim-Sin, Isin 12	100 sar	10 šekels	10 šekels
Number 87.....	Senkereh	Rim-Sin, Isin 20	90 sar	19 šekels	c. 21 šekels
Number 93.....	Senkereh	Rim-Sin	130 sar	14½ šekels	c. 11 šekels
Number 94.....	Senkereh	Rim-Sin	230 sar	12 šekels	c. 5 šekels
Number 98.....	Senkereh	Rim-Sin	200 sar	25 šekels	12½ šekels
Number 99.....	Senkereh	Rim-Sin	130 sar	14½ šekels	c. 11 šekels

Average price of orchards = 14 šekels per 100 sars
= 252 šekels per 1800 sars

Average price paid for farm lands, computed from 22 sales = 113½ šekels per 1800 sars

The value of date orchards is therefore more than double that of common farm land.